Southern Forest Health
Research and Management Update

Winter 2015

IN THIS ISSUE

This newsletter is a joint publication of:

USDA Forest Service
Southern Research Station
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A Renewed Edition

Welcome to a renewed effort toward a quarterly "forest health" newsletter produced jointly by two USDA Forest Service units**: Southern Research Station Research Work Unit 4552 – Insects, Disease and Invasive Plants of Southern Forests (SRS 4552)**, and **State and Private Forestry, Forest Health Protection (FHP) Southern Region.** The goal of this newsletter is to keep you informed about the science, management programs, publications, and other information/tools generated by these two units, including efforts in cooperation with our many collaborators. We invite you to contact us with questions or comments about our work and how we can better serve you with forest insect, disease, and invasive plant research and management.

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Science and Program Highlights

Exploring Integrated Management of the Hemlock Woolly Adelgid in the Southern Appalachians

Researchers access hemlock crowns using a lift truck

Mortality of eastern hemlock in the southern Appalachian Mountains is rapid and likely outpaces the ability of introduced predator beetles to establish, increase in number, and control adelgid populations. In a recent study in northern Georgia, Forest Service scientists and university partners examined the potential for combining chemical insecticide treatments and predator releases (biological control) in the same stands. Hemlock trees treated with a low rate of imidacloprid insecticide had better crown health and eventually supported as many or more adelgid prey and beetle predators (*Laricobius nigrinus*) than untreated trees.

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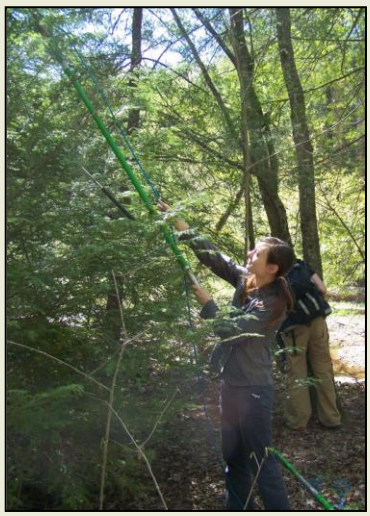
Using cages to exclude predators from selected branches, the researchers also showed that predators significantly reduced adelgid populations during the winter and early spring. Results suggest the potential to expand an integrated approach to hemlock woolly adelgid management. Read the full paper in Forest Ecology and Management 335:1-10 (http://www.treesearch.fs.fed.us/pubs/47111).

For additional information contact Bud Mayfield at amayfield02@fs.fed.us

Hemlock Woolly Adelgid Predator Beetle Releases and Recovery Efforts in the North Georgia Mountains

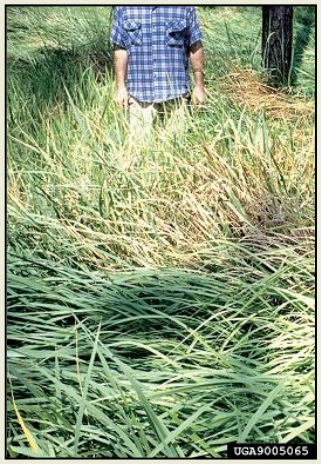
Eastern hemlock are threatened by the invasive hemlock woolly adelgid, Adelges tsugae that arrived in Georgia in 2003. In order to conserve some mature hemlocks in North Georgia, the USDA Forest Service created over 100 Hemlock Conservation Areas (HCAs) throughout the Chattahoochee National Forest. *Sasajiscymnus tsugae*, *Laricobius nigrinus*, and *Scymnus sinunodulus* are predatory beetles released in some of these areas. Following release, infested hemlock trees were sampled during spring 2010 – 2012 at some of these sites. Non-release sites 0.40 to 1.61 km from release areas were also sampled in 2012 to evaluate spread from release trees. *Sasajiscymnus tsugae* was found at 3 sites 3 years after release and at 2 other sites 2 years after release. Laricobius nigrinus was found at one site 3 years after release and at two sites 2 years after release. *Scymnus sinunodulus* was never recovered. Our results demonstrate that *S. tsugae* and *L. nigrinus*, are established in North Georgia, however their population sizes, efficacy, and survival rates are still unknown. Sampling at non-release sites showed that the native L. rubidus is a common predator associated with A. tsugae populations, but its effect on them is also unknown. Read the full article in J. Entomol. Sci. 49: 383-400 (http://www.treesearch.fs.fed.us/pubs/47311)



Sampling hemlock for predator beetles in Georgia

For additional information contact Jim Hanula at jhanula@fs.fed.us.

Making Headway Against the 7th Worst Weed in the World



Cogongrass infestation (Photo: J. Miller, USFS)

Like a business after a major shopping holiday, the state of Georgia's cogongrass program is finally profiting from all of their hard work. For the first time since the Forest Service Southern Region's Forest Health Protection Program began funding cogongrass control in 2004 for the state of Georgia, there are more dead cogongrass spots in the state than new areas of cogongrass being reported. This is a significant shift in the status of cogongrass for the state of Georgia and provides an opportunity to highlight a successful invasive plant treatment program. The Georgia Forestry Commission's Cogongrass Taskforce treats every cogongrass infestation that is reported in the state, and re-sprays as needed until they are negative for cogongrass for three years and receive 'eradicated' status. As budgets have dwindled over the years, the continued funding of the cogongrass initiative as well as the hard work and dedication of Georgia Forestry Commission staff have given hope to the notion of eradicating a weed that has consumed millions of dollars in control efforts throughout many Southern Gulf states.

For additional information contact Anna Greis algreis@fs.fed.us.

In the News

Mike Ulyshen receives SRS Director's Early Career Scientist Award

In recognition of remarkable contributions to the understanding of invasive insects and insect-pathogen complexes in forest ecosystems, research entomologist Mike Ulyshen (SRS 4552, Athens GA) was awarded the 2014 Southern Research Station Director's Early Career Scientist Award. Mike's highly-productive research program has included biology of the redbay ambrosia beetle, biodiversity impacts of Chinese privet, biological control of emerald ash borer, and ecological roles of wood decaying organisms. Congratualtions Mike!

Jim Hanula presents Mike Ulyshen with the 2014 SRS Director's Early Career Scientist Award.

Kent House Bug Day Team receives SRS Director's Partnership Award

Several SRS and FHP employees, along with numerous other team partners, received the 2014 Southern Research Station Director's Partnership Award for their implementation of the "Kent House Bug Day" event in Alexandria, LA. The annual outreach event provides hands-on educational (and fun!) activities for children and adults alike, with over 1400 in attendance in 2014. Congratulations team!

Some key organizers of Kent House Bug team included: Left to right: Bottom Row: JoAnne Barrett (SRS-4552), Stacy Blomquist (SRS-4552), Ashley DeKyzer (Kent House); Middle Row: Alice Scarborough (Kent House Director), Valli Preacher (FHP), Kristi Wharton (SRS-4158), Rabiu Olatinwo (SRS-4552), Back Row: Wood Johnson (FHP), Douglas Streett (SRS-4552 Project Leader), Will Shepherd (SRS-4552).

SRS 4552 Project Leader Doug Streett retires from Forest Service

Doug Streett retired from the Forest Service on December 31, 2014 after five years as the Project Leader for Insects, Diseases and Invasive Plants (RWU 4552). Prior to coming to in Pineville, LA with the Forest Service in 2009, Doug worked with Agricultural Research Service in Bozeman, Montana for nearly 16 years working on grasshoppers and in Stoneville, Mississippi for almost 13 years working on cotton pests and fire ants. Doug notes that the Forest Service was like a second family to him and he looks forward to retirement with anticipation and excitement. Congratulations Doug, you will be greatly missed!

Brian Strom presents Doug Streett with a plaque at Doug's retirement celebration.

Susan Stanley and Valli Peacher retire from Forest Health Protection

The FHP Alexandria Field Office bids a fond farewell to Susan Stanley and Valli Peacher, two of our long-time favorites in the office. Susan is renowned for her sweet nature and competence as our Administrative Assistant. Susan began with FHP in 1984 and has been with us ever since. Her faithful dedication to her job is irreplaceable and will be missed. Valli has worked for 30 years as a Computer Assistant with our group. As such, she has played an integral part in the development and maintenance of the Southern Pine Beetle Information System (SPBIS). She also coordinated the annual southern pine beetle surveys in the Alexandria Field Office zone. Her willingness to help her coworkers on other projects will be missed.

Technology Transfer

Publications (in print/press):

1. Arsenault, A.L., A.E. Mayfield, and K.F. Wallin. **Ambulatory responses of *Laricobius nigrinus* (Coleoptera: Derodontiade), a hemlock woolly adelgid predator, to odors from prey, host foliage, and feeding conspecifics**. Journal of the Entomological Society of British Columbia (in press).
2. Aylward, F.O., G. Suen, P.H.W. Biedermann, A.S. Adams, J.J. Scott, S.A. Malfatti, T. Glavina del Rio, S.G. Tringe, M. Poulsen, K.F. Raffa, K.D. Klepzig, and C.R. Currie. 2014. **Convergent bacterial microbiotas in the fungal agricultural systems of insects.** mBio 5:e02077-14.
3. Dodds, K., J. Allison, D. Miller, R. Hanavan, and J. Sweeney. 2014. **Considering species richness and rarity when selecting optimal survey traps: Comparisons of semiochemical baited flight intercept traps for Cerambycidae in eastern North America.** Agric. For. Entomol. In press.
4. Hanula, J.L. and A.E. Mayfield. 2014**. Redbay Ambrosia Beetle (*Xyleborus glabratus* Eichhoff)**. Pp 299-308 In: Van Driesche and R. Reardons (eds.). The Use of Classical Biological Control to Preserve Forests in North America. FHTET-2013-02. USDA Forest Service, Forest Health Technology Enterprise Team, Morgantown, West Virginia, USA.
5. Jones, C.E., J.L. Hanula and S. K. Braman. 2014. **Emergence of Laricobius nigrinus (Fender) (Coleoptera: Derodontidae) in the North Georgia Mountains.** J. Entomol. Sci. 49(4): 401-412.
6. Jones, C.E., N.P. Havill, J.L. Hanula and S. K. Braman. 2014. **Post Release Recovery of Hemlock Woolly Adelgid Predators in the North Georgia Mountains.** J. Entomol. Sci. 49(4): 383-400.
7. Klepzig, K.D, R. Shelfer, and Z. Choice. 2014. **Outlook for coastal plain forests: A subregional report from the Southern Forest Futures Project**.: USDA-Forest Service, Southern Research Station. 68 p. Station ID: GTR-SRS-196
8. Lobe, J. W., M. A. Callaham Jr., P. F. Hendrix, and J. L. Hanula. 2014. **Removal of an invasive shrub (Chinese privet: Ligustrum sinense Lour) reduces exotic earthworm abundance and promotes recovery of native North American earthworms**. Appl. Soil Ecol. 83:133–139.
9. Mayfield, A.E. III, and P.L. Lambdin. 2014. **Walnut Twig Beetle (*Pityophthorus juglandis* Blackman) (Coleopptera: Curculionidae: Scolytinae)**. Pp 299-308 In: Van Driesche and R. Reardons (eds.). The Use of Classical Biological Control to Preserve Forests in North America. FHTET- 2013-02. USDA Forest Service, Forest Health Technology Enterprise Team, Morgantown, West Virginia, USA.
10. Mayfield, A.E. III, B.C. Reynolds, C.I. Coots, N.P. Havill, C. Brownie, A.R. Tait, J.L. Hanula, S.V. Joseph, and A.B. Galloway. 2015. **Establishment, hybridization and impact of *Laricobius* predators on insecticide-treated hemlocks: Exploring integrated management of the hemlock woolly adelgid.** Forest Ecology and Management 335: 1-10.
11. Miller, D.R., K.J. Dodds, E.R. Hoebeke, T.M. Poland and E.A. Willhite. **Variation in the effects of conophthorin on**

catches of ambrosia beetles to ethanol-baited traps. J. Econ. Entomol. In press.

12. Shepherd, W.P., M.E. Montgomery, B.T. Sullivan, and A.E. Mayfield. 2014. **Novel method for determining sex of live adult *Laricobius nigrinus* (Coleoptera: Derodontidae).** The Canadian Entomologist 146: 693-696.
13. Ulyshen, M.D. in press. **Wood decomposition as influenced by invertebrates**. Biological Reviews.
14. Ulyshen, M.D. in press. **Insect-mediated nitrogen dynamics in decomposing wood**. Ecological Entomology.

Submitted Publications (in review):

1. Mason, C.J., K.D. Klepzig, B. Kopper, P. Kersten, B. Illman, K.F. Raffa. 2014. **Interspecific differences in sensitivity among fungal associates**. J. Chem. Ecol. Subm.

Workshops and Tours:

1. Hanula, J. L., S. Horn, M. Ulyshen and M. Callaham. 2014. Field tour of the Chinese privet removal project at Sandy Creek Nature Center. SE Exotic Plant Pest Council Annual Meeting, Athens, GA, Nov 12-14, 2014.

SRS scientists discuss a Chinese privet removal experiment during a field tour at Sandy Creek Nature Center.

Presentations:

1. Hanula, J. L. and S. Horn. 2014. **Effect of forest management on red-cockaded woodpecker prey and other invertebrates**. In, Integrating Invertebrates into Wildlife Science and Management: The Importance of our Most Abundant and Diverse Wildlife Group. The Wildlife Society Annual Meeting, Pittsburgh, PA, October 17-20.
2. Hanula, J.L., A.E. Mayfield, III and S. W. Fraedrich. 2014. **Redbay ambrosia beetle and laurel wilt: biology, population trends and potential for control in southern forests**. In, P-IE Section Symposium: Exploring Complex Interactions among Non-Native Bark and Ambrosia Beetles (Coleoptera: Scolytinae), their Associated Fungi, and

Naïve Hosts, Annual Meeting of the Entomological Society of America, 16-20 Nov 2014, Portland, OR.

3. Klepzig, K.D. and J.T. Nowak. 2014. **Preventing damage from a southern pest in northern forests: The future of the Southern Pine Beetle Program?** IUFRO World Congress, Salt Lake City, UT
4. Lucardi, R.D. and G.N. Ervin. **Invasion, part two: Patterns of genetic diversity following expansion in the novel range**. A Joint Symposium of the10th Annual GA-EPPC and 16th Annual SE-EPPC Conference. November 2014. Athens, GA (Poster).
5. Lucardi, R.D, D.C. Outlaw, G.E. MacDonald. **Hybridization Between Wild-Type Cogongrass and the Horticultural Cold-Tolerant Cultivar, Red Baron (*Imperata cylindrica* var. konegii [Rubra])**. A Joint Symposium of the 10th Annual GA-EPPC and 16th Annual SE-EPPC Conference. November 2014. Athens, GA.
6. Mayfield, A., and S. Salom. 2014. **Buying time: Integrating biological and chemical control of the hemlock woolly adelgid.** Society of American Foresters National Convention, 11 Oct 2014, Salt Lake City, UT.
7. Miller, D.R., J.D. Allison, C.M. Crowe, D. Dickinson, A. Eglitis, R.W. Hofstetter, A.S. Munson, T.M. Poland, L.S. Reid, B.E. Steed and J.D. Sweeney. **Ipsenol, monochamol and α-pinene: Trap lure blend for *Monochamus* species (Cerambycidae) in Canada and USA.** Annual meeting, Entomological Society of America, Portland OR. November 2014.
8. Miller, D.R., J.D. Allison, C.M. Crowe, D. Dickinson, A. Eglitis, R.W. Hofstetter, A.S. Munson, T.M. Poland, L.S. Reid, B.E. Steed and J.D. Sweeney**. Ipsenol, monochamol and α-pinene: Trap lure blend for *Monochamus* species (Cerambycidae) in Canada and USA.** Canadian Forest Service National Pest Forum, Ottawa ON, Canada. December 2014.
9. Nowak, J.T., J.R. Meeker, C.J. Fettig and D.R. Coyle. 2014. **Southern Pine Beetle Management: Influences of Prescribed Fire.** Society of American Foresters National Convention, 11 Oct 2014, Salt Lake City, UT.
10. Schulz, A., C. Asaro, D.R. Coyle, M. Cram, R.D. Lucardi, A.M. Mech, K.J.K. Gandhi . **Mapping the Distribution of a Potentially New Tiny Terror in Southern White Pine Forests.** Entomology 2014, ESA's 62nd Annual Meeting. November 2014. Portland, OR.
11. Schulz, A., C. Asaro, D.R. Coyle, M. Cram, R.D. Lucardi, A.M. Mech, K.J.K. Gandhi. **Cyptic Killer or Indulgent Insect? *Matsucoccus macrocicatrices* and its Relationship with Pinus strobus in the Southern Appalachian Mountains.** Entomology 2014, ESA's 62nd Annual Meeting. November 2014. Portland, OR (Poster).
12. Sweeney, J., P.J. Silk, R. Webster, D.R. Miller, J. Gutowski, K. Ryall, Q. Meng, L. Yan, L. Flaherty, D. Langor, G. Pohl, R. Johns, V. Grebennikov, B. Gill and T. Kimoto. **Factors affecting diversity and abundance of longhorn beetles captured in semiochemical-baited traps.** Annual meeting, Entomological Society of America, Portland OR. November 2014.
13. Sweeney, J., P.J. Silk, R. Webster, R. Johns, L. Flaherty, D. Langor, G. Pohl, J. Gutowski, T. Mokrzycki, D. Miller, M. Quigfan and T. Kimoto. **Effect of pheromone-enhanced lures and trap heights on detection of Cerambycidae**. Canadian Forest Service National Pest Forum, Ottawa ON, Canada. December 2014.
14. Ulyshen, M. D. **Exploring the connection between arthropod-accelerated wood decay and forest productivity**. 20 mins. [International Union of Forest Research Organizations (IUFRO) meeting, Salt Lake City, UT, 2014]
15. Ulyshen, M. D. and S. V. Diehl. **Arthropods and flooding affect microbial communities in dead wood.** Poster. [International Union of Forest Research Organizations (IUFRO) meeting, Salt Lake City, UT, 2014]